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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
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EXAMINER

GARY, ERIKA A

ART UNIT PAPER NUMBER

2681

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/819,109

Applicant(s)

GUPTA ET AL.

Examiner

Erika A. Gary

Art Unit

2681

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16-24 and 26-30 is/are rejected.
- 7) ☒ Claim(s) 15 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 3-10 are rejected under 35 U.S.C. 102(e) as being anticipated by applicant's submission of prior art, Ding et al., US Patent Number 5,838,787 (hereinafter Ding).

Regarding claim 1, Ding discloses a device comprising: a communication module configured to communicate with a base station in a wireless communications system; an acoustic echo canceller configured to detect and cancel an acoustic echo generated during a communication between said device and said base station; a network echo suppressor receiving an input from said acoustic echo canceller and passing said communication to said acoustic echo canceller, said network echo suppressor attenuating a network echo generated during said communication between said device and said base station [fig. 2; col. 1: lines 7-10; col. 3: lines 25-55].

Regarding claim 3, Ding discloses said acoustic echo canceller operates in at least two distinct modes of operation [col. 1: lines 7-10].

Regarding claim 4, Ding discloses said modes of operation include a hands free mode [col. 1: lines 7-10].

Regarding claim 5, Ding discloses said modes of operation include a handset mode [col. 1: lines 7-10], as it is inherent that devices equipped with a hands free functionality also work in a handset mode.

Regarding claim 6, it is inherent that a hands free mode includes a headset mode.

Regarding claim 7, it is inherent that the acoustic echo canceller includes a muting parameter.

Regarding claim 9, it is inherent that the network echo suppressor includes processing logic – i.e. state machine)].

Regarding claim 10, Ding discloses the network echo suppressor includes a gain module [fig. 2].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ding in view of Umemoto, US Patent Number 5,416,829 (hereinafter Umemoto).

Regarding claim 2, Umemoto discloses a dual mode cellular radio communication device including an echo canceller wherein the device operates in both and analog (i.e. AMPS) and digital system (i.e. CDMA) [col. 1: lines 15-22; abstract].

Ding and Umemoto are combinable because they are from the same field of endeavor, that is, communication devices with echo cancellers. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Ding to include Umemoto to incorporate usage in a plurality of systems for greater diversity.

5. Claims 11-14, 16-24, and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's submission of prior art, Romesburg, US Patent Number 6,185,300 (hereinafter Romesburg) in view of Ding.

Regarding claim 11, Romesburg discloses a method comprising steps of: coupling a plurality of acoustic echo canceller parameters from an acoustic echo canceller to a network echo suppressor; determining a voice activity parameter; computing a coherence estimate of a transmit signal sample and a receive signal sample to detect a network echo; providing said voice activity parameter and said coherence estimate to said network echo suppressor; attenuating said network echo with said network echo suppressor [col. 5: line 64 – col. 6: line 31].

What Romesburg does not specifically disclose is that the attenuated network echo is passed to said acoustic echo canceller. However, Ding teaches this limitation [fig. 2; col. 3: lines 25-55].

Romesburg and Ding are combinable because they are from the same field of endeavor, that is, communication devices with echo cancellers and network echo suppressors. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Romesburg to include Ding. The motivation for this combination would have been to improve the sound quality of the device.

Regarding claim 12, Romesburg discloses the coupling step comprises setting said plurality of said acoustic echo canceller parameters, and said network echo suppressor reading said plurality of said acoustic echo canceller parameters [col. 6: lines 11-31].

Regarding claim 13, it is inherent that the determining step comprises using vocoder frame rate determination as this is known in the art for detecting voice activity.

Regarding claim 14, Romesburg discloses the computing step comprises computing a coherence estimate on a block of samples, wherein said block of samples comprises said transmit signal samples and said receive signal samples [col. 20: lines 37-40 (it is inherent that a block of samples is used to determine if an echo or double-talk is occurring)].

Regarding claim 16, Romesburg discloses said providing step comprises setting said voice activity parameter and said coherence estimate and said network echo suppressor reading said voice activity parameter and said coherence estimate [col. 6: lines 11-31].

Regarding claim 17, Romesburg discloses said providing step comprises providing said voice activity parameter and said coherence estimate to a state machine

[col. 6: lines 11-31 (it is inherent that the echo suppressor includes processing logic – i.e. state machine)].

Regarding claim 18, Romesburg discloses said attenuating step comprises executing a state machine [col. 6: lines 11-31 (it is inherent that the echo suppressor includes processing logic – i.e. state machine)].

Regarding claim 19, Romesburg discloses said attenuating step comprises setting a receive gain parameter [col. 18: lines 55-60].

Regarding claim 20, Romesburg discloses said attenuating step comprises using a gain module to attenuate a receive signal, said gain module attenuating said receive signal according to a value of a receive gain parameter [col. 18: lines 55-60].

Regarding claim 21, Romesburg discloses a method for communicating between a base station and a mobile station, said method comprising steps of: determining a voice activity parameter of said communication; computing a coherence estimate of a transmit signal sample of said communication and a receive signal sample of said communication to detect a network echo; ascertaining a plurality of acoustic echo canceller parameters from an acoustic echo canceller; providing said voice activity parameter, said coherence estimate, and said plurality of acoustic echo canceller parameters to a network echo suppressor; attenuating said network echo with said network echo suppressor [col. 5: line 64 – col. 6: line 31].

What Romesburg does not specifically disclose is that the attenuated network echo is passed to said acoustic echo canceller. However, Ding teaches this limitation [fig. 2; col. 3: lines 25-55].

Romesburg and Ding are combinable because they are from the same field of endeavor, that is, communication devices with echo cancellers and network echo suppressors. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Romesburg to include Ding. The motivation for this combination would have been to improve the sound quality of the device.

Regarding claim 22, Romesburg teaches a dual mode cellular radio communication device including an echo canceller wherein the device operates in both and analog (i.e. AMPS) and digital system (i.e. CDMA) [col. 7: lines 3-5].

Regarding claim 23, it is inherent that the determining step comprises using vocoder frame rate determination as this is known in the art for detecting voice activity.

Regarding claim 24, Romesburg discloses said computing step comprises computing a coherence estimate on a block of samples, wherein said block of samples comprises said transmit signal samples and said receive signal samples [col. 20: lines 37-40 (it is inherent that a block of samples is used to determine if an echo or double-talk is occurring)].

Regarding claim 26, Romesburg discloses said ascertaining step comprises setting said plurality of said acoustic echo canceller parameters, and said network echo suppressor reading said plurality of said acoustic echo canceller parameters [col. 6: lines 11-31].

Regarding claim 27, it is inherent that the plurality of said acoustic echo canceller parameters includes a muting parameter and a mode of operation parameter as the telephone can be muted or used in a hands free mode.

Regarding claim 28, Romesburg discloses said providing step comprises providing said voice activity parameter and said coherence estimate and said plurality of acoustic echo canceller parameters to a state machine [col. 6: lines 11-31 (it is inherent that the echo suppressor includes processing logic – i.e. state machine)].

Regarding claim 29, Romesburg discloses said attenuating step comprises executing a state machine [col. 6: lines 11-31 (it is inherent that the echo suppressor includes processing logic – i.e. state machine)].

Regarding claim 30, Romesburg discloses said attenuating step comprises executing a state machine, said state machine setting a receive gain parameter, and using a gain module to attenuate a receive signal, and gain module attenuating said receive signal according to said receive gain parameter [col. 18: lines 55-60].

Allowable Subject Matter

6. Claims 5 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 11, and 21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Romesburg et al., US Patent Number 6,622,030, disclose echo suppression using adaptive gain based on residual echo energy.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erika A. Gary whose telephone number is 703-308-0123. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh N. Tran can be reached on 703-305-4040. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750 or to the 2600 Customer Service Office at 703-306-0377.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:


(703) 872-9306 (for informal or draft communications, please label "PROPOSED" or "DRAFT").

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive Arlington, VA., Sixth Floor (Receptionist).

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Art Unit: 2681

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EAG
December 11, 2003


ERIKA GARY
PATENT EXAMINER